

CLAIMS

1 1. A flow divider for receiving fluent matter from at least one source and dividing the
2 fluent matter substantially equally among a plurality of destinations, the flow divider
3 comprising:

4 (a) a housing;

5 (b) a first chamber in the housing, the first chamber being defined by a first
6 radially inwardly facing surface and a first wall, the first chamber having an inlet
7 in fluid communication with said at least one source and an outlet in fluid
8 communication with a first one of said plurality of destinations;

9 (c) a first cylindrical hub rotatably mounted in the first chamber, a first radial slot
10 extending through the first hub, and a second radial slot extending through the
11 first hub transverse to the first slot;

12 (d) a first vane slidably mounted in the first slot and having opposite vane ends
13 seating against the first radially inwardly facing surface;

14 (e) a second vane slidably mounted in the second slot and having opposite vane
15 ends seating against the first radially inwardly facing surface;

16 (f) a second chamber in the housing, the second chamber being defined by a
17 second radially inwardly facing surface and a second wall, the second chamber

18 having an inlet in fluid communication with said at least one source and an outlet
19 in fluid communication with a second one of said plurality of destinations;
20 (g) a second cylindrical hub rotatably mounted in the second chamber and
21 drivingly linked to the first hub, a third radial slot extending through the second
22 hub, and a fourth radial slot extending through the second hub transverse to the
23 third slot;
24 (h) a third vane slidably mounted in the third slot and abutting the second radially
25 inwardly facing surface at opposite vane ends; and
26 (i) a fourth vane slidably mounted in the fourth slot and abutting the second
27 radially inwardly facing surface at opposite vane ends.

1 2. The flow divider in accordance with claim 1, further comprising:

2 (a) a third chamber in the housing, the third chamber being defined by a third
3 radially inwardly facing surface and a third wall, the third chamber having an inlet
4 in fluid communication with said at least one source and an outlet in fluid
5 communication with a third one of said plurality of destinations;
6 (b) a third cylindrical hub rotatably mounted in the third chamber and drivingly
7 linked to the second hub, a fifth radial slot extending through the third hub, and a
8 sixth radial slot extending through the third hub transverse to the fifth slot;
9 (c) a fifth vane slidably mounted in the fifth slot and abutting the third radially
10 inwardly facing surface at opposite vane ends; and

11 (d) a sixth vane slidably mounted in the sixth slot and abutting the third radially
12 inwardly facing surface at opposite vane ends.

1 3. The flow divider in accordance with claim 1, wherein the housing, hubs and vanes can
2 all be disassembled for cleaning.

1 4. The flow divider in accordance with claim 1, wherein the inlets and the outlets are
2 cavities formed in the respective radially inwardly facing surfaces, and each of said
3 cavities is in fluid communication with a corresponding passage formed through the
4 housing.

1 5. The flow divider in accordance with claim 4, further comprising a longitudinal
2 passage formed through the housing, said passage being in fluid communication with
3 each inlet and said source.

1 6. The flow divider in accordance with claim 1, wherein said first and second hubs are
2 drivingly linked by at least one protrusion extending from the second hub into at least one
3 corresponding recess formed in the first hub.

1 7. The flow divider in accordance with claim 6, wherein said at least one protrusion
2 further comprises at least one longitudinal tang extending from one end of the second

3 hub, and said corresponding recess further comprises at least one longitudinal slot formed
4 in one end of the first hub.

1 8. The flow divider in accordance with claim 1, further comprising a first end cap
2 mounted to a first end of the housing, and a second end cap mounted to a second,
3 opposite end of the housing, said end caps forming closures for the chambers.

1 9. The flow divider in accordance with claim 8, wherein said first end cap has a recess
2 for receiving at least one protrusion formed on one of said hubs.

1 10. The flow divider in accordance with claim 9, wherein each of said hubs has a
2 reduced-diameter necked region forming a shoulder, and an aperture is formed in each
3 wall at each chamber for rotatably receiving said necked region of a corresponding hub.

1 11. A flow divider for receiving fluent matter from at least one source and dividing the
2 fluent matter substantially equally among a plurality of destinations, the flow divider
3 comprising:

4 (a) a first housing with a first chamber defined by a first radially inwardly facing
5 cylindrical surface and a first wall, the first chamber having an inlet in fluid
6 communication with said at least one source and an outlet in fluid communication
7 with a first one of said plurality of destinations;

- 8 (b) a first cylindrical hub rotatably mounted in the first chamber, a first radial slot
9 extending through the first hub, and a second radial slot extending through the
10 first hub transverse to the first slot;
- 11 (c) a first vane slidably mounted in the first slot and having opposite vane ends
12 seating against the first radially inwardly facing cylindrical surface;
- 13 (d) a second vane slidably mounted in the second slot and having opposite vane
14 ends seating against the first radially inwardly facing cylindrical surface;
- 15 (e) a second housing rigidly mounted to the first housing, the second housing
16 having a second chamber defined by a second radially inwardly facing cylindrical
17 surface and a second wall, the second chamber having an inlet in fluid
18 communication with said at least one source and an outlet in fluid communication
19 with a second one of said plurality of destinations;
- 20 (f) a second cylindrical hub rotatably mounted in the second chamber and
21 drivingly linked to the first hub, a third radial slot extending through the second
22 hub, and a fourth radial slot extending through the second hub transverse to the
23 third slot;
- 24 (g) a third vane slidably mounted in the third slot and abutting the second radially
25 inwardly facing cylindrical surface at opposite vane ends; and
- 26 (h) a fourth vane slidably mounted in the fourth slot and abutting the second
27 radially inwardly facing cylindrical surface at opposite vane ends.

1 12. The flow divider in accordance with claim 11, further comprising:

2 (a) at least a third housing rigidly mounted to the second housing, the third
3 housing having a third chamber defined by a third radially inwardly facing
4 cylindrical surface and a third wall, the third chamber having an inlet in fluid
5 communication with said at least one source and an outlet in fluid communication
6 with a third one of said plurality of destinations;

7 (b) a third cylindrical hub rotatably mounted in the third chamber and drivingly
8 linked to the second hub, a fifth radial slot extending through the third hub, and a
9 sixth radial slot extending through the third hub transverse to the fifth slot;

10 (c) a fifth vane slidably mounted in the fifth slot and abutting the third radially
11 inwardly facing cylindrical surface at opposite vane ends; and

12 (d) a sixth vane slidably mounted in the sixth slot and abutting the third radially
13 inwardly facing cylindrical surface at opposite vane ends.

1 13. The flow divider in accordance with claim 11, wherein the housings, hubs and vanes
2 can all be disassembled for cleaning.

1 14. The flow divider in accordance with claim 11, wherein the inlets and the outlets are
2 cavities formed in the respective radially inwardly facing cylindrical surfaces, and each
3 of said cavities is in fluid communication with a corresponding passage formed through
4 the respective housing.

1 15. The flow divider in accordance with claim 14, further comprising a longitudinal
2 passage formed through each of said housings, said passages aligning when the housings
3 are mounted together to form a longitudinal conduit in fluid communication with each
4 inlet and said source.

1 16. The flow divider in accordance with claim 11, wherein said first and second hubs are
2 drivingly linked by at least one protrusion extending from the second hub into at least one
3 corresponding recess formed in the first hub.

1 17. The flow divider in accordance with claim 16, wherein said at least one protrusion
2 further comprises a pair of longitudinal tangs extending from one end of the second hub,
3 and said corresponding recess further comprises a pair of longitudinal slots formed in one
4 end of the first hub.

1 18. The flow divider in accordance with claim 11, further comprising a first end cap
2 mounted to a first end of the housings, and a second end cap mounted to a second,
3 opposite end of the housings, said end caps forming closures for the chambers.

1 19. The flow divider in accordance with claim 18, wherein said first end cap has a recess
2 for receiving at least one protrusion formed on one of said hubs.

1 20. The flow divider in accordance with claim 19, wherein each of said hubs has a
2 reduced-diameter necked region forming a shoulder, and an aperture is formed in each
3 wall of each chamber for rotatably receiving said necked region of a corresponding hub.

1 21. The flow divider in accordance with claim 11, wherein each of the housings has a tab
2 on one end and a notch on an opposite end for matingly engaging a notch and a tab,
3 respectively, on adjacent structures.

1 22. A device for receiving fluent matter from a plurality of sources and combining the
2 fluent matter substantially equally to at least one destination, the device comprising:

3 (a) a housing;

4 (b) a first chamber in the housing, the first chamber being defined by a first
5 radially inwardly facing surface and a first wall, the first chamber having an inlet
6 in fluid communication with a first one of said plurality of sources and an outlet
7 in fluid communication with said at least one destination;

8 (c) a first cylindrical hub rotatably mounted in the first chamber, a first radial slot
9 extending through the first hub, and a second radial slot extending through the
10 first hub transverse to the first slot;

11 (d) a first vane slidably mounted in the first slot and having opposite vane ends
12 seating against the first radially inwardly facing surface;

- 13 (e) a second vane slidably mounted in the second slot and having opposite vane
14 ends seating against the first radially inwardly facing surface;
- 15 (f) a second chamber in the housing, the second chamber being defined by a
16 second radially inwardly facing surface and a second wall, the second chamber
17 having an inlet in fluid communication with a second one of said plurality of
18 sources and an outlet in fluid communication with said at least one destination;
- 19 (g) a second cylindrical hub rotatably mounted in the second chamber and
20 drivingly linked to the first hub, a third radial slot extending through the second
21 hub, and a fourth radial slot extending through the second hub transverse to the
22 third slot;
- 23 (h) a third vane slidably mounted in the third slot and abutting the second radially
24 inwardly facing surface at opposite vane ends; and
- 25 (i) a fourth vane slidably mounted in the fourth slot and abutting the second
26 radially inwardly facing surface at opposite vane ends.

1 23. The device in accordance with claim 22, further comprising:

- 2 (a) a third chamber in the housing, the third chamber being defined by a third
3 radially inwardly facing surface and a third wall, the third chamber having an inlet
4 in fluid communication with a third one of said plurality of sources and an outlet
5 in fluid communication with said at least one destination;

- 6 (b) a third cylindrical hub rotatably mounted in the third chamber and drivingly
7 linked to the second hub, a fifth radial slot extending through the third hub, and a
8 sixth radial slot extending through the third hub transverse to the fifth slot;
9 (c) a fifth vane slidably mounted in the fifth slot and abutting the third radially
10 inwardly facing surface at opposite vane ends; and
11 (d) a sixth vane slidably mounted in the sixth slot and abutting the third radially
12 inwardly facing surface at opposite vane ends.

1 24. The device in accordance with claim 22, wherein the housing, hubs and vanes can all
2 be disassembled for cleaning.

1 25. The device in accordance with claim 22, wherein the inlets and the outlets are
2 cavities formed in the respective radially inwardly facing surfaces, and each of said
3 cavities is in fluid communication with a corresponding passage formed through the
4 housing.

1 26. The device in accordance with claim 25, further comprising a longitudinal passage
2 formed through the housing, said passage being in fluid communication with each inlet
3 and said destination.

1 27. The device in accordance with claim 22, wherein said first and second hubs are
2 drivingly linked by at least one protrusion extending from the second hub into at least one
3 corresponding recess formed in the first hub.

1 28. The device in accordance with claim 27, wherein said at least one protrusion further
2 comprises at least one longitudinal tang extending from one end of the second hub, and
3 said corresponding recess further comprises at least one longitudinal slot formed in one
4 end of the first hub.

1 29. The device in accordance with claim 22, further comprising a first end cap mounted
2 to a first end of the housing, and a second end cap mounted to a second, opposite end of
3 the housing, said end caps forming closures for the chambers.

1 30. The device in accordance with claim 29, wherein said first end cap has a recess for
2 receiving at least one protrusion formed on one of said hubs.

1 31. The device in accordance with claim 30, wherein each of said hubs has a reduced-
2 diameter necked region forming a shoulder, and an aperture is formed in the wall at each
3 chamber for rotatably receiving said necked region of a corresponding hub.